Tennessee Pollution Prevention Partnership Success Story

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Reduction of Hazardous Waste

The Member

MAHLE, Inc. is a member of the German headquartered MAHLE Group, a leading manufacturer of pistons and other engine components. For over 80 years, MAHLE has numbered among the leading international manufacturers of high quality components for the automotive industry. Groundbreaking innovations have made MAHLE a reliable and successful partner to its customers.

In Morristown, MAHLE, Inc. serves automotive and diesel piston customers and is the leading producer of power cell modules in North America. Over 1,400 employees are proud of their quality, reliability and delivery to their customers. MAHLE, Inc. is ISO-14001 and TS-19649 certified.

The Story

MAHLE, Inc. was a Large Quantity Discharger of hazardous waste between 2001 and 2003, generating on average over 40,000 pounds of waste each year. The majority of the hazardous waste during these three years was generated from a newly installed coating process for steel pistons. Another significant source of hazardous waste was from the disposal of paper towels used to wipe coated pistons during inspections and to clean the silk screens from two piston Grafal® coating processes.

MAHLE installed a new steel piston phosphate coating process in 2001. The process startup testing resulted in several chemical bath changes and generated over 84,000 pounds of acidic hazardous waste during the first year. Hazardous waste was reduced to 54,800 pounds the following year as changes were made to the chemical bath. Production increased in 2003 with the improved chemical bath, but a problem with bath quality generated 19,800 pounds of hazardous waste bath and sludge. A department review of the bath chemistry and production demands resulted in a policy of changing the phosphate bath monthly in 2004. By neutralizing the acid phosphate bath and sludge with a process caustic cleaner used for the heat exchanger, the bath and sludge could be removed as non-hazardous material. This resulted in no hazardous waste being generated from the coating process in 2004.

For aluminum automotive pistons, a graphite coating is silk screened onto the side of the piston. Inspections of the piston include wiping the surface with a clean paper towel. Used and dirty silk screens are cleaned with alcohol and paper towels. All the paper wipes were disposed as hazardous waste. Work experience reduced the generated waste from 9,700 pounds in 2000 to 6,000 pounds in 2002, but two more coating processes were added in 2003 and the hazardous waste increased by 82%. The process waste was reviewed and samples of the wipe towels indicated that only the wet wipe towels used to clean the silk screens were hazardous by flammability. Through segregation and removal of the non-hazardous dry towels, the hazardous waste generated in 2004 was reduced by 52%, even though production from the four coating lines increased by 20%.

The Success

The change to monthly phosphate bath cleanouts and in-process neutralization of the phosphate bath eliminated the hazardous waste generation in 2004. The reclassification of the dry paper wipe towels reduced the hazardous waste generated by over 50%, even though the production of Grafal® coated pistons increased by 20%. The total hazardous waste generated in 2004 was 77% less than 2003.

The reduction in hazardous waste handling fees, reduction in drums used, and reduction in waste generator fees resulted in an annual savings of $38,500.

The Pollution Prevented

This yearlong waste reduction project reduced the hazardous waste generated at MAHLE by 31,700 pounds, or 15.8 tons.

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